

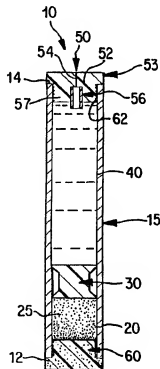


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: A61K 9/48	A3	(11) International Publication Number: WO 98/42317 (43) International Publication Date: 1 October 1998 (01.10.98)
<p>(21) International Application Number: PCT/US98/04637</p> <p>(22) International Filing Date: 10 March 1998 (10.03.98)</p> <p>(30) Priority Data: 60/035,607 24 March 1997 (24.03.97) US</p> <p>(71) Applicant (for all designated States except US): ALZA CORPORATION [US/US]; 950 Page Mill Road, P.O. Box 10950, Palo Alto, CA 94303-0802 (US).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): GUMUCIO, Juan, C. [US/US]; 3063 Forbes Avenue, Santa Clara, CA 95051 (US). DIONNE, Keith, E. [US/US]; 4 Hancock Park, Cambridge, MA 02139 (US). BROWN, James, E. [US/US]; 126 Blueberry Hill Drive, Los Gatos, CA 95032 (US).</p> <p>(74) Agents: CLARKE, Pauline, Ann et al.; Alza Corporation, 950 Page Mill Road, P.O. Box 10950, Palo Alto, CA 94303-0802 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 30 December 1998 (30.12.98)</p>

(54) Title: IMPLANTABLE DELIVERY DEVICE WITH SELF ADJUSTABLE EXIT PORT**(57) Abstract**

A delivery device having a first chamber containing an osmotic agent, a membrane forming a wall of the first chamber through which fluid is imbibed by osmosis, a second chamber containing a beneficial agent to be delivered, and a moveable piston separating the two chambers. In fluid communication with the second chamber is an orifice which comprises a slit valve. In the presence of pressure, the beneficial agent pushes through the slit, opening up a channel for delivery of the beneficial agent and creating flow. Because the slit remains closed in the absence of flow (or when the pressure is below the pressure required to open the slit), back diffusion of external fluids is eliminated when the slit is closed, which prevents contamination of the beneficial agent in the second chamber by external fluids. In addition, forward diffusion of the beneficial agent out of the capsule is prevented when the slit is closed. The slit valve opens only to the minimum dimension required to allow the flow generated by the osmotic pumping rate. The slit valve also allows a flow path to open around any obstruction in the slit valve to prevent clogging.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MY	Malaysia	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon	KR	Republic of Korea	PL	Poland		
CN	China	KZ	Kazakhstan	PT	Portugal		
CU	Cuba	LC	Saint Lucia	RO	Romania		
CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/04637

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61K9/48

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 318 558 A (LINKWITZ ANDREAS ET AL.) 7 June 1994	1,8,12
A	see column 2, line 25-59 see column 3, line 17-21 see column 4, line 50 - column 5, line 8 see claim 1 see figure 1	13,17
A	EP 0 627 231 A (ALZA CORP) 7 December 1994 see page 2, line 11-19 see claim 1 see figure 2	1,12,13, 17
A	WO 93 06819 A (ALZA CORP) 15 April 1993 see page 15, line 24 - page 17, line 26 see figures 3,4	1-3,8-10

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"S" document member of the same patent family

Date of the actual completion of the international search

16 October 1998

Date of mailing of the international search report

22/10/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2220 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

La Gaetana, R

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/04637

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5318558 A	07-06-1994	US 5221278 A	22-06-1993
EP 0627231 A	07-12-1994	US 5308348 A	03-05-1994
		US 5456679 A	10-10-1995
WO 9306819 A	15-04-1993	AU 2867492 A	03-05-1993
		EP 0607321 A	27-07-1994
		JP 7500264 T	12-01-1995
		MX 9205850 A	01-06-1993
		NZ 244682 A	23-12-1993
		PT 100944 A	30-06-1994
		US 5795591 A	18-08-1998
		ZA 9207779 A	05-07-1993